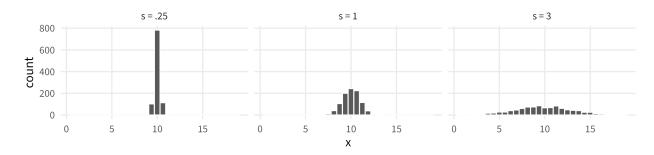
NOTES 05: QUANTITATIVE VARIABLES

Stat 120 | Fall 2025 Prof Amanda Luby

Quantitative variables are	best visualized with a histogram	or dotplot (depending on sample size)
		most about the shape and center . When we mber, we often choose the mean , median , o
Skewed Right	Symmetric	Skewed Left
: There are various ways to	describe the center of the distrib	ution. The three most common are:
Mean		
Median		
Mode		

1 Standard Deviation





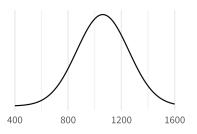
The **68, 95, 99 rule** says that:

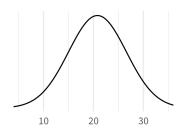
Example: Standardized test scores are often designed to have bell-curved distributions. The mean reported ACT score at Carleton is 33 with a standard deviation of 1.493. If we assume that Carleton's distribution is also symmetric and approximately bell-shaped, what interval gives the ACT score range of 95% of students?

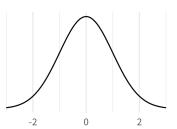
2 Z-Scores

Z-Score

Example: The nationwide average ACT score is 20.8 with a standard deviation of 5.8. The nationwide average SAT score is 1060 with a standard deviation of 195. A college admissions officer wants to determine which of two applicants scored better on their standardized test with respect to the other test-takers: Jordan, who earned an 1310 on their SAT, or Jim, who scored a 31 on his ACT?







3 Boxplots

A boxplot is a visualization of the **five number summary**, plus outliers.

Outlier

Boxplots are especially useful for comparing *quantitative variables* across different levels of a *categorical variable*.

4 Outliers and Skewed Data

Outliers can be annoying. We have three options for dealing with them:

- 1. Ignore them, and note that results may be impacted
- 2. Remove them, and note that results may be impacted (preferably include results from (1))
- 3. Transform the variable so they "matter" less

